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31 January 1963

MEMORANDUM

SUBJECT: Range Capabilities of the Coastal Defense Missile in Cuba

1. After extensive analysis we are confident that the coastal defense missile deployed in Cuba is a modified version of the Soviet AS-1 Kennel, an air-launched turbo-jet powered missile with an estimated maximum range of about 55 nautical miles. In its role as a ground-launched anti-ship weapon, this missile probably has a maximum range of 30 to 40 nautical miles with a warhead weight of about 2,200 pounds.

2. The present operational range of this weapons system in a surface-launched role is limited by the guidance system. The maximum line-of-sight range of the acquisition and tracking radar is about 40 miles which corresponds to the nominal aerodynamic range of the vehicle. The use of a mid-course inertial guidance system or of ships or aircraft as relay stations to extend the guidance range is possible, but this would also involve substantial modification to the guidance system. This would be extremely difficult to achieve under field conditions in Cuba.

3. However, it is theoretically possible to extend the range of the missile by trading fuel for warhead weight or by adding external wing tanks to the vehicle. By reducing the warhead weight to 500 pounds and adding fuel, a range of about 300 miles could be achieved but this exchange is not easily accomplished. Considerations of fuel tank locations, missile center of gravity limits, hardware, plumbing, and ancillary equipment would soon result in a new design. This would be difficult to effect in the field, and probably would require some flight testing.

4. The other alternative of adding external tanks to the basic configuration would also have its complications but is considered more feasible than the exchange of warhead weight for fuel. The addition of two wing tanks carrying a total of 134 gallons of

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fuel (a reasonable limit) could extend the basic range about 100 nautical miles. It is not known whether the vehicle is designed to carry external tanks under conditions of high acceleration experienced in a jet-assisted take-off. No external fuel tanks have been observed in the photography.

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